

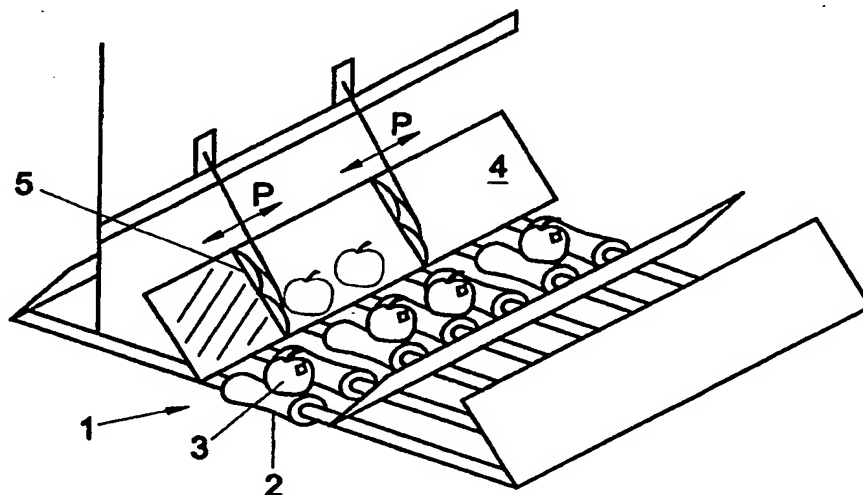


## INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

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<b>(21) International Application Number:</b> PCT/NL99/00681 <b>(22) International Filing Date:</b> 5 November 1999 (05.11.99)  <b>(30) Priority Data:</b> 98203722.8      6 November 1998 (06.11.98)      EP  <b>(71) Applicant (for all designated States except US):</b> FPS FOOD PROCESSING SYSTEMS B.V. [NL/NL]; Burg. G.J.F.Tijdemanstraat 13, NL-2631 RE Nootdorp (NL).  <b>(72) Inventors; and</b> <b>(75) Inventors/Applicants (for US only):</b> DE GEUS, Johannes, Cor- nelis [NL/NL]; Van Musschenbroeckstraat 67, NL-2522 AJ The Hague (NL). VAN DER KRAAN, Johannes, Jacobus [NL/NL]; Krokuslaan 2, NL-2631 JK The Hague (NL). PE- TERS, Robert [NL/NL]; Beethovenlaan 68, NL-2215 SH Voorhout (NL).  <b>(74) Agent:</b> OTTEVANGERS, S., U.; Verenigde, Nieuwe Parklaan 97, NL-2587 BN The Hague (NL).		<b>(81) Designated States:</b> AU, CA, IL, JP, NZ, US, ZA, European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE).  <b>Published</b> <i>With international search report.</i> <i>In English translation (filed in Dutch).</i>

**(54) Title:** PANE-WIPING APPARATUS**(57) Abstract**

An apparatus for sweeping or wiping at least one side of a transparent or reflecting plate (4) intended for imaging objects (3) through or via the plate (4), which objects (3) are located on the at least one side of the plate (4), comprises at least one sweeping or wiping element (5) which during sweeping or wiping assumes a fixed position with respect to the plate (4) which during the wiping is reciprocated in contact with the sweeping or wiping element (5), while at least the part of the plate (4) is swept or wiped that is subsequently used for imaging. More in particular, the apparatus comprises two sweeping or wiping elements (5), while the part of the plate (4) located between the sweeping elements (5) is used for imaging. With great advantage this apparatus is arranged on sorting apparatuses (1) for sorting fruit supplied to an imaging apparatus via a channel or after having passed a washing apparatus.



Title: Pane-wiping apparatus

The present invention relates to a pane-wiping apparatus, in particular to an apparatus for sweeping or wiping at least one side of a transparent or reflecting plate intended for imaging objects through or via the plate, which  
5 objects are located on the at least one side of the plate:

Such apparatuses are generally known, especially in car engineering in which window wipers sweep or wipe in particular windscreens to remove in particular a profusion of water to give the driver a sufficient view during driving a  
10 vehicle.

In general, soiling, in particular through water, may occur in situations in which a view is required via transparent plates or mirrors. Thus, mirrors are meanwhile widely used in sorting apparatuses in which, for instance,  
15 objects or products like fruit, vegetables or eggs are sorted and selected after they have been imaged via the above mirrors and the images have been used to apply selection and sorting criteria thereto.

More in particular, sorting apparatuses exist in which the products, after having passed a washing apparatus, or also after having been supplied floatingly by means of a liquid supply track, are imaged. When these objects or products pass the mirrors, the mirrors appear to soil the mirrors after a shorter or longer time. This is understood to  
20 mean both the deposition of dirt on the surfaces of the mirrors and their getting wet. Correctly imaging the objects or products is thereby substantially prevented. The images will be deformed, and the objects will not be visible on the soiled spots of the mirrors.

30 Objects to be sorted with sorting apparatuses as mentioned above often render it necessary to continuously follow and image the objects or products. The use of a pane-wiping apparatus in which the sweeper or wiper is passed in the usual manner over a fixedly arranged plate or mirror is  
35 then disadvantageous. The sweeper or wiper repeatedly passing

In the figures the same parts are indicated by the same numerals.

Fig. 1 is a schematic view of a plate wiped or swept by a sweeping or wiping element moved over the plate or mirror. The image is then continuously intersected by the wiper or sweeper.

Fig. 2A shows the apparatus with a single sweeper or wiper. After each sweeping operation another, that is to say, the adjacent area is swept and is therefore most suitable for imaging. Thus, as shown, only a relatively small area is used for imaging, but the imaging apparatus will have to change positions when high requirements are imposed on the images.

Fig. 2B shows the apparatus with two sweepers or wipers. A great advantage thereof is that always the same part of the mirror can be used.

Fig. 2C clearly shows that by placing one of the sweepers or wipers, and not placing the other, on the plate or mirror to be swept, the sweeping operation can be carried out in such a manner that the dirt and/or moisture to be removed is not passed over the part for imaging.

In the perspective view of Fig. 3, a part of a sorting apparatus 1 for sorting fruit 3, such as apples, is shown. The apples lie on so-called rollers of diabolos 2 and are passed between two mirrors 4. The mirrors are used to take side pictures of the passing and meanwhile rotating fruits by means of a camera, not shown, for instance arranged above the part of the sorting apparatus 1 shown. Wipers 5 are moved over the fixedly arranged mirror 4 in the direction of the arrows P. For clarity's sake, the figure only shows a single pair of wipers 5.

Figs. 4A and B show, likewise in perspective view, a mirror arrangement similar to that of Fig. 3. In these figures the sweepers are fixedly arranged, while the mirrors are moved in the direction of the arrows Q1 and Q2. As indicated by the arrows R1 and R2, the wipers are placed respectively on and remote from the mirrors. Thus the dirt or

Claims

1. An apparatus for sweeping or wiping at least one side of a transparent or reflecting plate intended for imaging objects through or via the plate, which objects are located on the at least one side of the plate, characterized in that the apparatus comprises at least one sweeping or wiping element which during sweeping or wiping assumes a fixed position with respect to the plate which during wiping is reciprocated in contact with the sweeping or wiping element, while at least the part of the plate is swept or wiped that is subsequently used for imaging.
2. An apparatus according to claim 1, characterized in that a supply for cleaning liquid is arranged near the part of the plate to be swept or wiped.
3. An apparatus according to claim 1 or 2, characterized in that the sweeping or wiping element is a pane-wiper blade.
4. An apparatus according to any of the preceding claims, characterized in that the direction of movement of the reciprocating plate is substantially perpendicular to the main direction of the sweeping or wiping element.
5. An apparatus according to any of the preceding claims, characterized in that the apparatus comprises two sweeping or wiping elements, while the part of the plate located between the sweeping or wiping elements is used for imaging.
6. An apparatus according to claim 5, characterized in that only the sweeping or wiping element with which the part of the plate intended for imaging is going to be swept is in contact with the plate.
7. A sorting apparatus, provided with the apparatus according to any of the preceding claims.

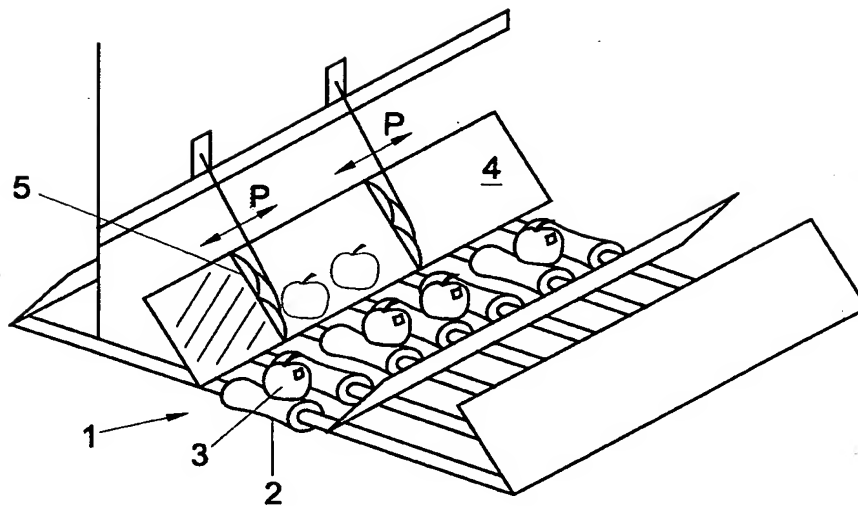


Fig. 3

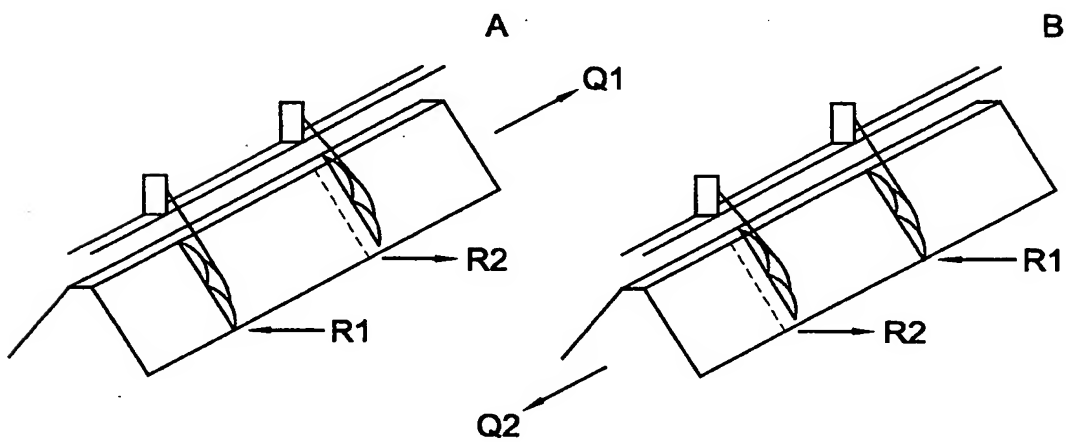


Fig. 4

# INTERNATIONAL SEARCH REPORT

International Application No

PCT/NL 99/00681

## C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	DE 29 31 266 A (ERWIN SICK GMBH OPTIK-ELEKTRONIK) 5 February 1981 (1981-02-05) page 3, line 1 - line 7 page 6, line 9 -page 7, line 30; figures -----	1,2
A	US 4 473 279 A (SAKAKI) 25 September 1984 (1984-09-25) abstract; figures -----	1,3,4,7